

Application No. 10/786,409
Filed: February 25, 2004
TC Art Unit: 1733
Confirmation No.: 3997

AMENDMENT TO THE CLAIMS

1. (Currently Amended) A method of making a multi-perforated part out of ceramic matrix composite material, the method comprising the steps consisting in of:

preparing a fiber preform having fibers and pores for constituting the a fiber reinforcement of the composite material;

consolidating the preform by partial densification by depositing forming within it sufficient the preform a solid matrix phase having a thickness sufficient for binding the fibers of the fiber preform to one another, but without densifying the preform completely, a volume ratio of the pores in the preform being reduced by no more than 40%;

putting a plurality of pins of rigid material into place through the consolidated preform without the consolidated preform being deformed;

continuing densification of the consolidated preform provided with the pins by depositing a ceramic material forming at least one ceramic matrix phase; and

eliminating at least a portion of each pin so as to leave a calibrated perforation passing through the part, the pins being made at least in part out of a material that can be eliminated by

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applying a treatment that does not affect the deposited ceramic material ~~of the matrix~~.

2. (Original) A method according to claim 1, wherein the pins put into place are made entirely out of material that can be eliminated.

3. (Original) A method according to claim 1, wherein pins are used made with a core portion of material that can be eliminated and a peripheral portion or sheath of ceramic that is not eliminated when the core portion is eliminated.

4. (Original) A method according to claim 1, wherein the material of the pins that can be eliminated is eliminated by oxidation.

5. (Original) A method according to claim 1, wherein the pins used are made by densifying and stiffening a yarn or tow of carbon by means of a matrix.

6. (Original) A method according to claim 1, wherein the pins are put into place by a process comprising initially inserting the pins in a block of compressible material, bringing the block of

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compressible material into contact with the consolidated preform, and applying ultrasound energy to the pins while compressing the block of compressible material so as to cause the pins to penetrate into the consolidated preform.

7. (Currently Amended) A method according to claim 1, wherein the pins are implanted in a direction forming a non-zero angle relative to the a normal to the a surface of the consolidated preform.

8. (Original) A method according to claim 1, wherein preform consolidation comprises forming a ceramic matrix phase of small thickness.

9. (Original) A method according to claim 1, wherein preform consolidation comprises forming a carbon matrix phase of small thickness.

10. (Cancelled)

11. (Currently Amended) A method according to claim 1, wherein a preform is used in which the volume ratio of the pores has a value

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lying in the range 50% to 70%, and consolidation is preformed until the volume ratio of the pores is reduced to a value lying in the a range 40% to 60%.

12. (Original) A method according to claim 1, wherein the preform is densified with a ceramic matrix that includes at least one self-healing phase.

13. (Original) A method according to claim 1, for making a multi-perforated wall out of ceramic matrix composite material for a gas turbine combustion chamber.

14. (Original) A method according to claim 13, wherein the fiber preform is made by draping two-dimensional fiber plies.

15. (Original) A method according to claim 14, wherein the plies are bonded to one another.

16. (Original) A method according to claim 15, wherein the fiber preform is made up of a multilayer fabric.